TRANSMIT DIVERSITY PROCESSING FOR A MULTI-ANTENNA COMMUNICATION SYSTEM

ABSTRACT

For transmit diversity in a multi-antenna OFDM system, a transmitter encodes, interleaves, and symbol maps traffic data to obtain data symbols. The transmitter processes each pair of data symbols to obtain two pairs of transmit symbols for transmission from a pair of antennas either (1) in two OFDM symbol periods for space-time transmit diversity or (2) on two subbands for space-frequency transmit diversity. $N_T \cdot (N_T - 1)/2$ different antenna pairs are used for data transmission, with different antenna pairs being used for adjacent subbands, where N_T is the number of antennas. The system may support multiple OFDM symbol sizes. The same coding, interleaving, and modulation schemes are used for different OFDM symbol sizes to simplify the transmitter and receiver processing. The transmitter performs OFDM modulation on the transmit symbol stream for each antenna in accordance with the selected OFDM symbol size. The receiver performs the complementary processing.